CONTINGENCY PLAN
for the
MiniBooNE Detector Data Acquisition, Storage, and Monitoring System
[ID 1108]

Prepared by:____ **Date:**_____________
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GCSC
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1. SYSTEM IDENTIFICATION

1.1. System Name/Title

Fermilab Experiment E-898/944 - MiniBooNE.(MiniBooster Neutrino Experiment) is responsible for the system discussed throughout this risk assessment. Fermilab Identifier CSP-MA-1108 Has been assigned to the system and will be referred to as the MiniBooNE data acquisition, storage and monitoring system, or MBDAQ.

1.2. System Type

This system is a Major Application (MA) and is contained in the General Computing Enclave

1.3. OMB 53 Exhibit Information

This system is contained by OMB 53 Exhibit “FNAL IT and Cyber Security Information Systems”, 019-20-01-21-01-XXXX-00-404-138.

1.4. Responsible Organization

Fermi National Accelerator Laboratory
PO Box 500
Batavia, IL 60510

1.5. Information and Security Contact(s)

Security contacts are given in table 1. The system manager is registered in the MISCOMP database. The GCSC is identified at http://computing.fnal.gov/security/contacts.html

Table 1, security contacts for the MBDAQ:

Title	Name	Email	Telephone
Management Contact	Steve Brice	sbrice@fnal.gov	630.840.8748
MA Coordinator	Chris Green	greenc@fnal.gov	630.840.2167
System Manager	Amber. Boehnlein	cope@fnal.gov	630-879-5105
GCSC	Jason Hedden	jhedden@fnal.gov	630-840-6669
Physical Key Holders	MBCR Operator MCR Crew Chief	www-boone.fnal.gov www-bd.fnal.gov	630.840.2757 630.840.3721

1.6. System Operational Status

The MBDAQ is in the Operational phase of its life-cycle.

1.7. Information Gathering Technique

This assessment was carried out by the preparer, and vetted with document review by system experts and users.

1.8. General Description/Purpose

This system provides for data acquisition, storage and monitoring for MiniBooNE. MiniBooNE is a neutrino experiment that runs in the Booster Neutrino Beam – a facility roughly consisting of a target to produce secondary particles, and a magnetic horn to focus the beam to a detector that resides at the MiniBooNE detector building (MDB).

1.9. System Description and Boundaries

MiniBooNE operates from a control room located in WH10W, where operators observe and monitor the beam, horn and detector. Control and operation of the proton beam and horn are in the hands of the Main Control Room operators, who cooperate with the MiniBooNE operators in finding and resolving problems. We can think of operations in two parts: control or, more accurately, monitoring of the beam and experiment, and data acquisition, which requires high bandwidth transfer of information from the beam and detector to the data storage center at the FCC. A third component of the system involves data storage in the Enstore facility at the FCC. MiniBooNE also uses seven terabyte servers for storage of processed data and simulated events. The computers involved in monitoring, data acquisition and data storage are listed in table 2.

Six main DAQ computers are located at the MBD. Two additional DAQ machines are located in the BNB and collect data from the Resistive Wall Monitor (RWM - measures proton beam intensity and timing) and the Little Muon Chamber (LMC – detects muon flux in the neutrino beam), which are located in MI12 and MI13A respectively. Data from these computers are transmitted to the MBD where the HAL9002 and HAL9004 collect all of the data and send it to Enstore.

The Monitor computers are standard PCs that have redundant functions. These computers are used to collect and present data to the operators in a coordinated fashion. Loss of any one of these computers is easily replaced with data collected by other computers, so that the operation of the beam or experiment is not dependent on them.

1.9.1 System Boundaries

The boundary of MBDAQ is at its network interface which connects the devices in Table 2 to the General Computing Enclave.

Table 2: List of computers in the MiniBooNE DAQ, data storage and monitoring systems.

Type	System Name	Purpose	Location	Owner	Computer Specs
DAQ	hal9000	Will be replaced by mbdaq01.	MBD	Fermilab	VALINUX; 2230
DAQ	mbdaq01	Will replace hal9000.	MBD	Fermilab	KOI: D-X-3200-2U-RM
DAQ	southport	Backup for mbdaq01; Currently serves as hal9004 replacement.	MBD	Fermilab	POLYWELL: 935X4A
Near-Line	hal9002	DAQ coordinator-will be replaced.	MBD	Indiana U.	PENGUIN: REL110-D-P3-1000-RM
Near-Line	hal9004	Died - temporarily replaced by southport.	MBD	Indiana U.	PENGUIN: REL110-D-P3-1000-RM
Near-Line	mbnl01	Will replace hal9004.	MBD	Fermilab	KOI: D-X-3200-1U-RM
DAQ	damen	Booster Neutrino Beam ACNET DAQ.	MBD	LANL	DELL" OPTIPLEX GX150
DAQ	dorchester	LMC DAQ	MI13A	U. of Colorado	DELL: POWER EDGE 2650
DAQ	walcott	RWM DAQ	MI12	LANL	DELL: DIMENSION XPS
DB Server	mbdb01	DB Server	FCC/2/218	Fermilab	KOI: D-X-3200-1U-RM
CR Terminal	colfax	MBCR Detector Monitor	WH1050	U. of Colorado	DELL: PRECISION WORKSTATION
CR Terminal	Magnolia	On-line eventy display/Booster monitor.	WH1050	Fermilab	DELL: PRECISION WORKSTATION
CR Terminal	cns22pc	MBCR ACNET monitor.	WH1050	Fermilab	GATEWAY: E4200-800P3
MI12 Terminal	hotspur	Horn monitor	MI12	Fermilab	DELL: XPS-T800_MT
Data Storage	mbdata05	Terabyte File Servers	FCC/2/218	Fermilab	On Order.
Data Storage	mbdata04	Terabyte File Servers	FCC/2/218	Yale	POLYWELL: D-X-3.2G-SATA-5U
Data Storage	mbdata03	Terabyte File Servers	FCC/2/218	Fermilab	POLYWELL: 2*X-3.06G-5U-RM
Data Storage	mbdata02	Terabyte File Servers	FCC/2/218	Fermilab	POLYWELL: 2*3.06G-XEON-4U-RM
Data Storage	mbdata01	Terabyte File Servers	FCC/2/218	Fermilab	POLYWELL: 2*3.06G-XEON-4U-RM
Data Storage	lake	Terabyte File Servers	FCC/2/218	Fermilab	POLYWELL: 2*3.06G-4U-RM
Data Storage	bishopford	Terabyte File Servers	FCC/2/218	Fermilab	POLYWELL: 935X8
Data Storage	edens	Terabyte File Servers	FCC/2/218	LANL	POLYWELL: 935X8
Data Storage	kingery	Terabyte File Servers	FCC/2/218	Princeton U.	POLYWELL:n2*-2.4G-3.8T-5U-RM
Data Storage	danryan	Terabyte File Servers	FCC/2/218	U. of Michigan	POLYWELL: 935X8

DB DataBase	RWM Resitive wall Monitor	MI12 BNB Service Building
DAQ Data Acquisition	LMC Little Muon Counters	MI13A Counting House for the LMC
MB MiniBooNE	CR Control Room	MBD MB Detector Building
ACNET Accelerator Control Net		

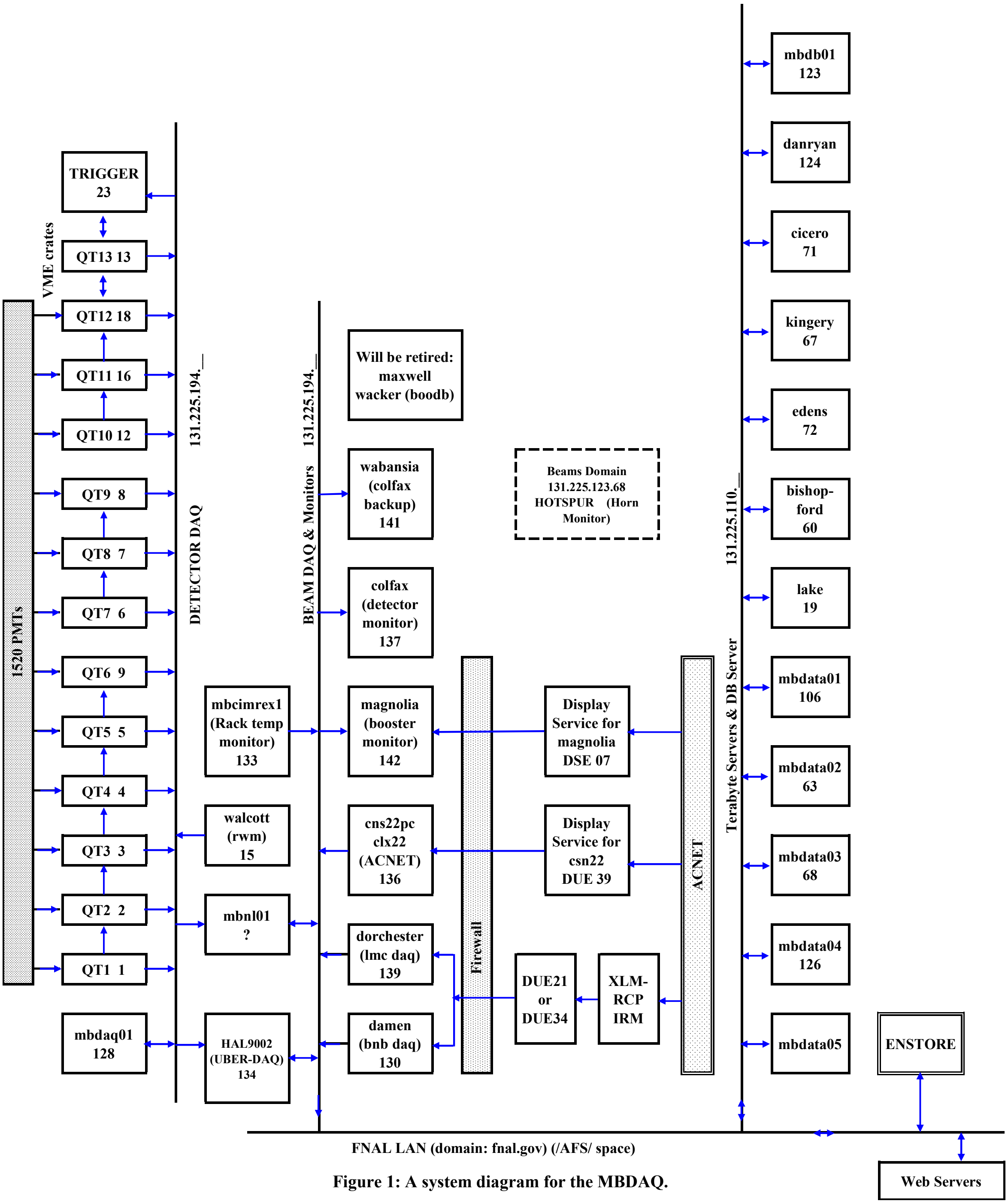

Figure 1: A system diagram for the MBDAQ.

1.10. Information Sensitivity

The data sensitivity on the MiniBooNE data acquisition, storage and monitoring system is classified in the following table:

Relative Importance of Protection Needs			
	HIGH (Critical Concern)	MEDIUM (Important Concern)	LOW (Minimum Concern)
Confidentiality			X
Integrity			X
Availability			X

The information available in the MBDAQ is relevant only to the physicists using the data. It has no relevance beyond the basic science carried out by the experiment.

2.0 Contingency plan

2.1 Purpose:

If a catastrophic event such as fire, flood, tornado, terrorist attack, or any other event that curtails operation of the MBDAQ in a substantial way, this plan provides for a minimum response that would preserve operations or minimize recovery time. The responsibility for execution of this plan lies with the individuals given in Table 1.

2.2 Planning Principles:

The MBDAQ operates with very little operator interference. When an event occurs that disables the DAQ, the electronics will shutdown safely by itself, provided no direct damage takes place to the DAQ itself. The responsibility of the MB CR operator is to assess the situation from the Control Room, and contact the relevant experts. Most experts can evaluate their system from home, or other locations if necessary. However, the main effort will be in turning power off, and securing equipment, if possible.

2.3 Line of Succession and Responsibilities:

The five people listed in Table 1 are the main respondents in the event of a catastrophic failure. All or our collaborators share in taking shift duties, and are informed about how to respond in unusual circumstances, including the need to alert the management team listed in Table 1. Additionally, a call list exists in the MB CR that identifies the experts associated with each system, and is available at the url – http://www-boone.fnal.gov/operation/Emergency/callist.html:
The list changes frequently. A current version is given in Table 2.

Table 2, security contacts for the MBDAQ:

Title	Name	Email	Telephone
Computing	Chris Green	greenc@fnal.gov	630.840.2167
CRL/Online Monitoring	Jon Link	link@fnal.gov	630.840.6316
DAQ	H. Ray	hray@fnal.gov	630-836.9761
Detector	P. Kasper	kasper@fnal.gov	505-667.3277
Electronics	R.V.Water	vdwater@lanl.gov	505-231.4871
Enstore	S. Zeller	gzeller@fnal.gov	630-207.5860
RWM	H.Ray	hray@fnal.gov	630-836.9761
Slow Monitoring	C.Cox	davicox@fnal.gov	812-855.2918
LMC	R. Nelson	rhn@fnal.gov	630-640.3433
Physical Key Holders	MBCR Operator MCR Crew Chief	www-boone.fnal.gov www-bd.fnal.gov	630.840.2757 630.840.3721

2.4 Operations in response to a catastrophic event:

Assuming beam is available from the Booster, MiniBooNE can take data as long as the computers on the 194 subnet and ACNET are available. The experiment can operate with local data storage devices for extended periods even if Enstore is not available. The experiment is not dependent on Wilson Hall or the control room to run and operate – However, a switch unit for the 194 subnet resides in Wison Hall and must the operational for the experiment to run. The kind of event that would disable the experiment might be a power outage, flood or fire at the detector building. In the event of a catastrophic failure, the experiment must respond to restore normal conditions and power as soon as possible. MiniBooNE will have backup machines for the DAQ machines, and a download to the replacement computers should be relatively straight forward.

A catastrophic event in the FCC2/211 could be unrecoverable. The experiment relies on the storage media to be able to withstand a normal power failure, and that fire protection is adequate for Enstore and the terabyte servers. No backup is available, and making one would be far too costly.

The computers used for analysis are located in Wilson Hall, mainly on the 10th floor west. A disruptive event that would damage storage media would have the most detrimental impact. However, most of the equipment and data available on the data analysis computers could be regenerated if necessary, be it at significant loss of time.

2.5 Notification and Activation Phase: Should state what has to happen for plan to be activated.

Since there are no significant options or tradeoffs and no non-obvious priorities to be decided in regards to the response to these events, there is no need for any special authority to be granted during a contingency situation.

3.0 Recovery

The MiniBooNE Control Room is staffed 24x7 and has contact information for all experts for call in to restart the experiment. All experts are on call to respond to recovery requirements. Everyone on the experiment participates in taking shifts, and is familiar with the key system and how to initiate a recovery process.

Unless the catastrophic event makes the Booster and Booster neutrino beam non-operational, the MBDAQ can generally be recovered within a reasonable time. However, some of the electronics is irreplaceable. The Q/T boards, in particular, would take a fairly long time, 3 months or more, to rebuild.